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ABSTRACT

Five cooperative learning methods are described with the theories that support them. The five methods are: (1) Group Investigation (GI), developed by S. Sharan and others; (2) Jigsaw, developed by E. Aronson and others; (3) Student Teams Achievement Divisions (STAD), developed by R. E. Slavin and others; (4) Learning Together, developed by D. W. Johnson and R. T. Johnson; and (5) MURDER, developed by D. Dansereau and others. GI is rooted in the philosophy of J. Dewey and humanistic psychology. Jigsaw and Learning Together derive from social psychology, mainly Gestalt and group dynamics, while STAD is influenced by behaviorism, and MURDER is based on cognitive psychology. Each approach is examined for its conceptual foundations. Although there are important differences between the philosophies and theories of learning underlying various cooperative learning methods, the methods are not mutually exclusive. One way to integrate these methods is by modifying them to increase areas of commonality. (SLD)

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FOUNDATIONS OF COOPERATIVE LEARNING

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Foundations of Cooperative Learning - Hawaii Educational Research Association 1990 Presentation -Honolulu, HI - January 9, 1990 - George M. Jacobs, Educational Psychology, University of Hawai'i at Manoa

What I've done in this paper is to look at five cooperative learning methods and the theories of learning which underlie them. Then, I've tried to see how these varying views of human learning are reflected in the characteristics of the five methods.

Let me begin with an analogy. Many people go swimming in the ocean, but different people are attracted to ocean swimming for different reasons, and these differences can be seen in what these various people do as they swim.

For example, some people swim for exercise. These people do sprints and are always looking at their waterproof watches to check their times and their heart rate. Other people have a very different approach. They like swimming because it's an opportunity to relax and get away from it all. This type of swimmer can often be seen floating on their back looking at the scenery.

I could go on to describe others attracted to ocean swimming by other motivations, such as to look at marine life or to socialize with friends, and, of course, many go to swimming for a combination of the above reasons. The point is that while these varied people are all going swimming in the ocean, each group is attracted by different aspects of what the activity has to offer, and, for each group, going to swimming means doing something partly different. At the same time, differences also exist among those who do not enjoy ocean swimming, but that's a whole separate topic.

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The point of this analogy is to say that, in the same way, different educators are attracted, and not attracted, to cooperative learning for different reasons, and these differences are reflected in the methods developed to implement Cooperative learning.

The five cooperative learning methods I've looked at in this paper are Group-Investigation (G-I), developed by Shlomo Sharan and colleagues; Jigsaw, developed by Eliot Aronson et al.; Student Teams Achievement Divisions (STAD), developed by Robert Slavin and colleagues; Learning Together, developed by David and Roger Johnson; and MURDER, developed by Donald Dansereau and colleagues.

After reading what these people had to say and some of the writings of people they credited as their predecessors, I've come up with four major foundations for these five cooperative learning methods. G-I is rooted in Deweyian philosophy and resonates with much of humanistic psychology, Jigsaw and Learning Together derive from social psychology, mainly Gestalt and group dynamics, STAD is influenced by behaviorism, and MURDER is based on cognitive psychology.

DEWEYIAN PHILOSOPHY AND HUMANISTIC PSYCHOLOGY

I'll begin with G-I. Sharan recounts how, as an 18-year-old college student, he took a course in which Dewey's Democracy and Education was the only book used. Sharan states that the course had a deep effect on his approach to education. "The Group-Investigative approach to cooperative learning is a

deliberate attempt to embody some of Dewey's principles in a set of procedures applicable to classrooms without the total redesign of a school environment and organization that Dewey wished to achieve" (Sharan, 1987, p.3).

What are the key points of Dewey's philosophy, and to what extent and how are they incorporated in G-I? Central ideas for Dewey are:

1) Learn by doing, students should be active;

2) Intrinsic motivation;

3) Knowledge is changing, not fixed;

4) Learning should relate to students' needs and interests;

5) Education should include learning to work with, respect, and understand others. Democratic procedures are essential;

6) Learning should be related to the world beyond the classroom and should help to improve that world.

G-I, I believe incorporates the first five ideas of Dewey, but not necessarily the sixth. Let's see how. In G-I, students choose their own topics from the general subject of the course. For example, if the class was studying 19th century Jewish immigration from Europe to South America, groups could form around such topics as: how the immigrants traveled, the conditions they faced in their new country, or what types of people decided to immigrate.

The students choose the topics and which group they will be in, with possible intervention by the teacher to make sure that key issues are covered, topics do not overlap, and the groups are

heterogeneous as to past achievement, gender, and ethnicity. Next, the groups formulate a research problem and decide how to investigate the problem using a division of labor. The teacher is only one among many resources. Students put the results of their investigation into a report which is presented to the class. Thus, the class is a group of groups, with each group teaching the others about one aspect of the topic.

In G-I, higher level thinking is encouraged. Evaluation is done, "through a cumulative view of the individual's work during the entire course of an investigative project" (Sharan & Hertz-Lazarowitz, 1980, p. 39).

G-I also actualizes many of the key principles of humanistic psychology. This is no coincidence, as humanistic education can be viewed as a continuation of Dewey's Progressive movement. Important concepts in a humanistic approach to education are: avoidance of evaluation via grades and tests, learning by doing and building on intrinsic motivation, student choice, treating students as responsible and able, open-ended questioning, encouraging respect for and help to others, and building positive self-concept (Purkey & Novak, 1984; Rogers, 1969; Snygg & Combs, 1949).

BEHAVIORIST PSYCHOLOGY

Now, let's move to the other end of the cooperative learning continuum and look at STAD, developed by Slavin and his colleagues. Slavin's review of the research has led him to believe that group contingencies are essential if small-group structures are to

enhance achievement. By group contingencies, Slavin means that, "the behavior of one or more group members brings rewards to a group" (Slavin, 1987, p. 30). The group contingencies work in two steps. First, the teacher offers rewards or punishments to the groups. Then, the group members apply rewards or punishments to each other.

Slavin believes that practices in conventional education, such as having students study alone and grading on a curve, create a climate in which students hope their classmates will fail. "The critique of traditional classroom organization made by motivational theorists is that the competitive grading and informal reward system of the classroom create peer norms that oppose academic efforts" (1990, p. 14).

Another important behaviorist concept is vicarious reinforcement (Bandura, 1965; 1977). This means that students learn not only by themselves being rewarded or punished, but also by seeing other people receive rewards or punishments. Cooperative learning, especially when students are heterogeneously grouped according to motivation and past achievement, offers many opportunities for students to experience positive models who are rewarded for their efforts.

In Slavin's review of the research (Slavin, 1983), he looked at 18 studies in which the achievement of student groups working together without group rewards based on individual learning were contrasted with control procedures. He found that, on measures of achievement, the students in the experimental groups outperformed

the controls only twice. At the same time, Slavin found that students who used cooperative learning which included group rewards for individual learning almost always outperformed control groups. By the way, Sharan reads the research differently (Sharan & Shachar, 1988).

While not denying a role to intrinsic motivation, Slavin believes that extrinsic motivation must be used. "Students receive about 900 hours of instruction every year. It is unrealistic to expect that intrinsic interest and internal motivation will keep them enthusiastically working day in and day out" (Slavin, 1987, p. 30). Slavin sees cooperative learning as a more efficient way of delivering extrinsic motivators.

Some typical features of behaviorist learning methods are:

1) extrinsic motivation;

2) low cognitive level tasks;

3) everyone does the same thing;

4) achievement is the objective, to be measured by objective tests; affect is not emphasized;

5) product orientation (Kagan, 1985);

6) teacher decides what is to be learned and gives students the information they are to learn.

In STAD, the teacher first lectures on the topic. Then, students are assigned to heterogeneous teams in which they study the teacher-prepared material in preparation for a quiz on that material. Each student's grade is based on their own score on the

quiz. But, at the same time, each student contributes to a group score. Each student's contribution to their group's score is based on how well they did on the quiz compared to their own average score on past quizzes. Thus, a relatively low achiever can contribute as much to their team as a high achiever without doing as well on the quiz as their higher-achieving teammate. The group score is used to determine which groups receive rewards such as certificates and recognition in newsletters.

While Slavin stresses the importance of group contingencies, he also sees the appeal of cooperative learning to those with a humanistic perspective. Humanists, as noted earlier, focus on the affective benefits of cooperative learning, e.g., increases in self-esteem, improved ethnic relations. Slavin's review of the research (1983) found that group contingencies were not necessary to the achievement of these goals. The humanists are attracted to cooperative learning for its other essential ingredient: group interaction. Slavin's conclusion is that "Cooperative learning represents an odd but happy marriage between behavioral and humanistic approaches to classroom motivation" (Slavin, 1987, p. 35).

SOCIAL PSYCHOLOGY

Now, let's look at the social psychology foundation of cooperative learning. Here, both Learning Together and Jigsaw are included. The Johnsons frequently cite Kurt Lewin and Morton Deutsch as their predecessors. Deutsch was a student of Lewin's

and David Johnson was a student of Deutsch's. Deutsch and Krauss (1965) explain that the Gestalt psychologists focused on perception. Perception has implications for the way people interact with one another. For example, the phenomenon of closure can be applied to the way that we judge others. Just as we fill in the missing part of a circle, so too do we use our past experience to fill gaps in our knowledge of others. For instance, if we see someone dressed as a Buddhist monk, we may assume that person is honest and not likely to try to steal our wallet.

Lewin brought a Gestalt perspective to motivation. He developed what became known as field psychology, which was inspired by the notion of the force field from the physical sciences. Key concepts were tension, valance, force, and locomotion. Tension is present inside a person when a psychological need or intention is present. Force is measured as to direction and strength resulting from tension. Valance can be positive or negative. A field is "a system of coexisting and mutually interdependent factors" (Deutsch & Krauss, 1965, p. 15).

This word "interdependent" is key for Deutsch and the Johnsons, as well as for Aronson. Deutsch's advance was to divide interdependence into two types: positive and negative, with a third possibility being that no interdependence exists between people. Deutsch did research on the effects of these different types of interdependence, finding that positive interdependence led to superior performance on objective and subjective measures.

What the Johnsons have done since is to greatly expand this

work by: 1) developing many ways of creating positive interdependence; 2) testing these cooperative learning structures in many settings; and, 3) popularizing the concepts and disseminating them among educators.

The Johnsons' system has five key elements:

1) positive interdependence;

2) individual accountability;

3) face-to-face interaction;

4) teaching collaborative skills;

5) processing group interaction.

One key way that this method of conceptualizing cooperative learning differs from STAD is the explicit emphasis that Learning Together places on improving team functioning. This can be seen most clearly in elements 4 and 5, i.e., teaching collaborative skills and processing group interaction.

The social psychologist Gordon Allport cites both Lewin and Deutsch in his classic work The Nature of Prejudice. Allport stated that in order for contact between different groups to lead to a reduction of prejudice, it must be between people of equal status, sanctioned by institutional supports, be in pursuit of common ends, and lead "to the perception of common interests and common humanity" (p. 281). Allport cites Lewin's work to support his contention that contact does not promote goodwill unless there is a shared goal (p. 488).

Eliot Aronson is a professor of psychology. He believed that

the 1954 Supreme Court decision banning school segregation would lead to a lessening of prejudice and improvements for minorities. But by the 1970s, he realized that "desegregation was not inevitably better for minority children, nor did it inevitably bring racial peace" (Aronson, et al. 1975, p. 43). He was asked by the superintendent of the Austin, Texas schools to develop ways of reducing racial tension.

Aronson looked at the schools and found teacher-fronted classrooms which bred competition among students. This competitive environment guaranteed that students do not come to like or to understand one another. Plus, it made racial tensions even worse. At the same time, this competition was almost always a losing game for minorities who tended to not be comfortable in the school culture.

Thus, Aronson saw that changing the educational process was necessary in order for students to see each other as collaborators, not competitors. In the form of Jigsaw, often now referred to as Jigsaw I (Kagan, 1991), that Aronson developed, each group member has a different part of the information necessary for group members to perform a given task. The only way for others to obtain this information is through their groupmates. Group success depends on each member mastering all the parts.

It appears that Learning Together and Jigsaw are more similar to G-I on some dimensions and more similar to STAD on others. (Of course, teachers have a fair degree of latitude as to how they implement these methods.) For example, Learning Together and

Jigsaw share with G-I an emphasis on building group relations. At the same time, they are like STAD in limiting students' freedom as to what to study and how to study it.

COGNITIVE PSYCHOLOGY

Cognitive psychology, perhaps the dominant view in education today, represents a very diverse set of beliefs. A common concern of all cognitive theories is how humans store and process what we learn. Two important currents in cognitive psychology were originated by Jean Piaget (1977; 1978) and Lev Vygotsky (1978). Both emphasized the importance of children interacting with others.

One cooperative learning method which derives from cognitive psychology is MURDER, developed by Donald Dansereau (Hythecker, Dansereau, & Rocklin, 1988). MURDER is a six-step script designed to be used by dyads. The steps are:

1. Setting the proper Mood by relaxing and focusing on the learning task.
2. Reading a passage section for Understanding with no pressure to memorize or comprehend details.
3. One partner gives an oral summary Recalling the material read.
4. Detecting, by the other partner, of errors and omissions in the summary.
5. Elaborating by both partners to make the material more memorable.
6. After reading the entire passage, Reviewing by both

partners of the entire passage by creating a supersummary of all the passage sections (Hythecker, Dansereau, & Rocklin, 1988, p. 25).

Dansereau and his colleagues find many possible explanations based on cognitive psychology, including explanations deriving from the work of Piaget and Vygotsky, for why the various steps in MURDER guide readers to enhanced learning. For example, the Recalling, Detecting, Elaborating, and Reviewing steps may lead to multiple encodings of the text because the members of the dyad have to verbally state, explain, expand on, and summarize the text's main ideas. Also, because the script focuses on main ideas, rather than encouraging readers to try to remember everything, processing of information may be more efficient. This idea of readers choosing what to focus on is one example of metacognition (thinking about and making decisions on one's thinking), a key area of interest for many cognitive psychologists (e.g., Brown, 1978).

Another possible advantage of the MURDER script is that the Elaboration step may lead readers to link key information in the text to what they already know. This latter point is in keeping with the ideas of David Ausubel (1968) who stressed that knowledge is stored by forming networks of related information.

In conclusion, I believe that although there are often important differences between the philosophies and theories of learning underlying various cooperative learning methods, it would

be wrong to see these methods as mutually exclusive. Indeed, the areas of commonality may outweigh the differences. One way to integrate the methods is by modifying them. For example, at the Youth Development Project in Hawaii, they train teachers in STAD, which may most easily be linked to the behaviorist tradition, but combine this with training in how to teach collaborative skills, something of which those from the social psychology, Deweyian, and humanist traditions would approve.

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